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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,229	01/25/2002	Durward S. Benham JR.	170-99-X44	3036

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EXAMINER
RODRIGUEZ, WILLIAM H

ART UNIT	PAPER NUMBER
3746	5

DATE MAILED: 09/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/057,229	BENHAM ET AL.	
	Examiner	Art Unit	
	William H. Rodriguez	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-9 and 11-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-9 and 11-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This office action is in response to the amendment and remarks filed 8/22/03. In making the below rejections, the examiner has considered and addressed each of the applicants arguments. Since the examiner has applied new grounds of rejection, this office action is being made non-final to afford the applicant the opportunity to respond to the new grounds of rejection.

Claim Objections

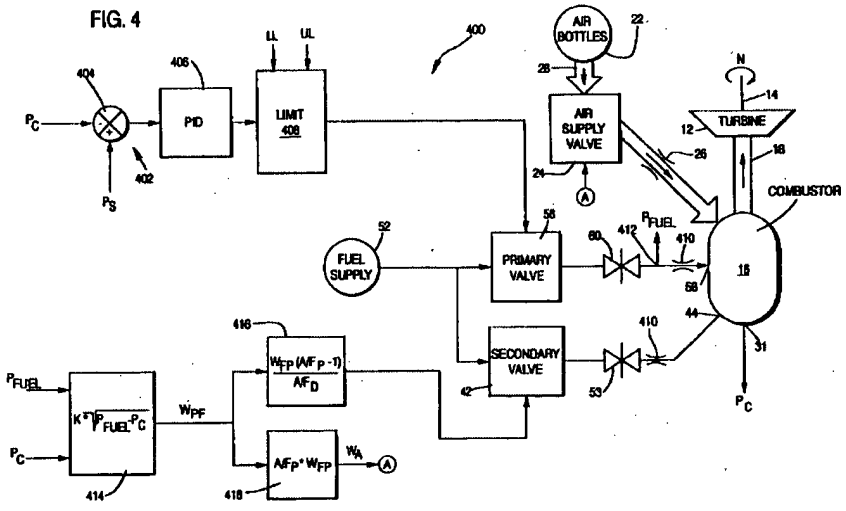
Claims 1, 8, 9, 17, 20 and 21 are objected to because of the following informalities: The meaning of word APU should be spelled out not abbreviated. Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 8, 17, 19, 20, 21, 22 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by **Lampe et al. (U.S patent No. 5,097,659)**.



With respect to claims 8, 21 and 22, **Lampe et al**. teach an apparatus for generating auxiliary and emergency power. This apparatus comprises a plurality of high-pressure storage vessels 22 (source of pressurized air); a source of jet fuel 52; a turbine 12; an airflow passageway joining the source of pressurized air 22 to the turbine 12; a fuel flow passage joining the source of jet fuel 52 to the turbine 12; and a separate valve assembly 24, 26, 56, 42, 60, 53, 410 located in each flow passageway for controlling the flow of compressed air and jet fuel into the turbine. Examiner gives official notice that it would have been inherent that the fuel tank would have included an expulsion device so as to be able to pump the fuel from the tank to the combustor. See particularly **Figure 4**; column 1 lines 7-8; column 6 lines 10-12 of Lampe.

With respect to claim 17, **Lampe et al**. teach an apparatus for generating auxiliary and emergency power. This apparatus comprises a plurality of high-pressure storage vessels 22 (source of pressurized air); a source of jet fuel 52; a turbine 12; an airflow passageway joining the source of pressurized air 22 to the turbine 12; a fuel flow passage joining the source of jet fuel 52 to the turbine 12; and a separate valve assembly 24, 26, 56, 42, 60, 53, 410 located in each flow passageway for controlling the flow of compressed air and jet fuel into the turbine, wherein the APU starter system excludes a pressure transducer and a temperature sensor (column 6 lines 43-50) See particularly **Figure 4**; column 1 lines 7-8; column 6 lines 10-12 of Lampe.

With respect to claim 19, **Lampe et al.** teach that the control valve comprises a fixed orifice valve 410 located between the fuel tank 52 and the turbine 12. See particularly **Figure 4** of Lampe.

With respect to claim 20, the operation of the prior art apparatus of **Lampe et al.** will inherently perform the claimed method.

With respect to claim 27, **Lampe et al.** teach that the valve assembly located in the fuel flow passageway comprises a modulating fuel control valve 56. See particularly **Figure 4** of Lampe.

3. Claims 8, 21, 22, 25, 26 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by **Lampe et al. (U.S patent No. 5,031,398).**

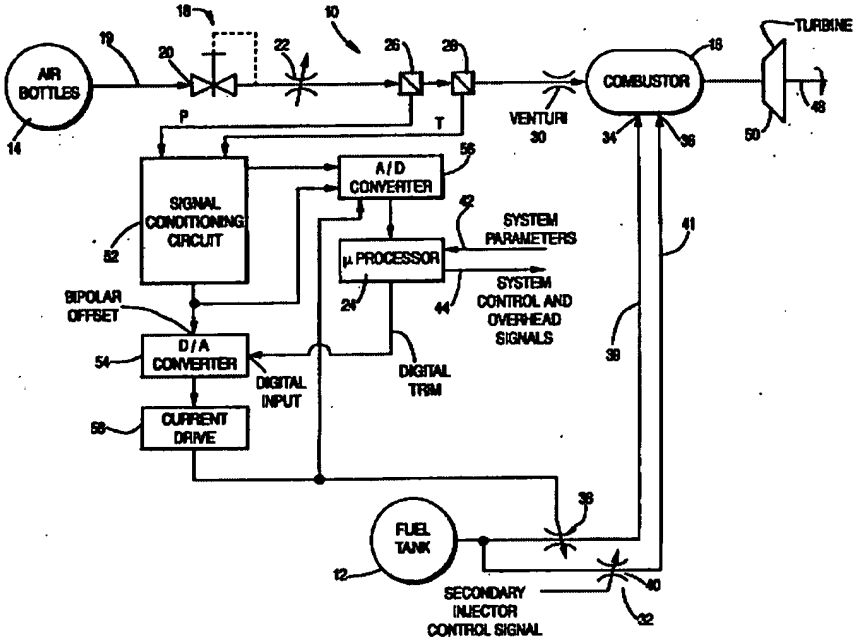


Figure 1.

With respect to claims 8, 21 and 22, **Lampe et al.** teach an apparatus for generating auxiliary and emergency power. This apparatus comprises a plurality of high-pressure storage vessels 22 (source of pressurized air); a source of jet fuel 52; a turbine 12; an airflow passageway joining the source of pressurized air 22 to the turbine 12; a fuel flow passage joining the source of jet fuel 52 to the turbine 12; and a separate valve assembly 24, 26, 56, 42, 60, 53, 410 located in each flow passageway for controlling the flow of compressed air and jet fuel into the turbine. Examiner gives official notice that it would have been inherent that the fuel tank would have

included an expulsion device so as to be able to pump the fuel from the tank to the combustor. See particularly **Figure 4**; column 1 lines 7-8; column 6 lines 10-12 of Lampe.

With respect to claim 25, **Lampe et al.** teach that the valve assembly located in the air flow passageway comprises a modulating air control valve 22 and a separate regulator and shutoff valve 20 located between the air control valve 22 and the source of pressurized air 14. See particularly **Figure 1** of Lampe.

With respect to claim 26, **Lampe et al.** teach that the valve assembly located in the air flow passageway comprises a fixed orifice valve 30 and a separate regulator and shutoff valve 20 located between the fixed orifice valve 30 and the source of pressurized air 14. See particularly **Figure 1** of Lampe.

With respect to claim 28, **Lampe et al.** teach that the valve assembly located in the fuel flow passageway comprises a fixed orifice valve 38. See particularly **Figure 1** of Lampe.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Lampe et al. (U.S patent No. 5,097,659)** in view of **Lampe et al. (U.S patent No. 5,031,398).**

With respect to claim 18, **Lampe et al. ('659)** teach an apparatus for generating auxiliary and emergency power. This apparatus comprises a plurality of high-pressure storage vessels 22

(source of pressurized air); a source of jet fuel 52; a turbine 12; an airflow passageway joining the source of pressurized air 22 to the turbine 12; a fuel flow passage joining the source of jet fuel 52 to the turbine 12; and a separate valve assembly 24, 26, 56, 42, 60, 53, 410 located in each flow passageway for controlling the flow of compressed air and jet fuel into the turbine, wherein the APU starter system excludes a pressure transducer and a temperature sensor (column 6 lines 43-50). Further, **Lampe et al. ('659)** teach that when a pressure transducer and a temperature sensor are eliminated, air control valve 24 is regulated so as to maintain a constant combustor pressure or "relatively" constant gas to fuel ratio and combustor exit temperature. **Lampe et al. ('659)** do not teach details about the air valve 24. However, **Lampe et al. ('398)** teach a similar system to **Lampe et al. ('659)** in which the valve assembly located in the air flow passageway comprises a modulating air control valve 22 and a separate regulator and shutoff valve 20 located between the air control valve 22 and the source of pressurized air 14. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted **Lampe's ('659)** valve 24 for **Lampe's ('398)** valves 20, 22 so as to be able to independently regulate the amount air-flow into the combustor (regulated by valve 22) from the amount of air-flow allowed to go through the air passageway by shut-off valve 20. This will allow air control valve 22 to be regulated so as to maintain a constant combustor pressure or "relatively" constant gas to fuel ratio and combustor exit temperature. See particularly **Figure 1** of Lampe (398).

5. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Lampe et al. (U.S patent No. 5,097,659)** in view of **Seal et al. (U.S. 5,822,838).**

With respect to claim 23, **Lampe et al.** described in more detail above claims an apparatus similar to the claimed invention but do not teach that the high-pressure storage vessels each have an aluminum-lined composite configuration. However, **Seal et al.** teach that high-performance fibers offer very high strength-to-weight ratios and are ideal for making lightweight pressure vessels. However, composite laminates fabricated with these fibers have relatively high permeability and cannot contain high-pressure liquids or gasses or low-pressure gasses for extended periods of time. Therefore, composite pressure vessels must have a liner to prevent leakage. For high pressure or gas containment, metal liners such as aluminum are typically used. For lightweight, high-pressure gas containment, there are basically two primary technologies (a) graphite/epoxy composite with a yielding aluminum liner, and (b) Kevlar/epoxy with load-sharing liners (typically stainless steel, titanium alloy, or inconel). The aluminum-lined, graphite/epoxy tank is the most prevalent technology, but it has limitations. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the high pressure vessel from an aluminum-lined composite configuration so as to obtain a high strength, permeable light weight vessel. See particularly column 1 lines 25-40 of Seal et al.

With respect to claim 24, Examiner gives official notice that it would have been inherent that the fuel tank would have included an expulsion device so as to be able to pump the fuel from the tank to the combustor. Further, it is well known in the art that the expulsion device could be of the piston-type, bladder-type, diaphragm-type, free-surface-type etc.

6. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Lampe et al. (U.S patent No. 5,031,398)** in view of Seal et al. (U.S. 5,822,838).

With respect to claim 23, **Lampe et al.** described in more detail above claims an apparatus similar to the claimed invention but do not teach that the high-pressure storage vessels each have an aluminum-lined composite configuration. However, **Seal et al.** teach that high-performance fibers offer very high strength-to-weight ratios and are ideal for making lightweight pressure vessels. However, composite laminates fabricated with these fibers have relatively high permeability and cannot contain high-pressure liquids or gasses or low-pressure gasses for extended periods of time. Therefore, composite pressure vessels must have a liner to prevent leakage. For high pressure or gas containment, metal liners such as aluminum are typically used. For lightweight, high-pressure gas containment, there are basically two primary technologies (a) graphite/epoxy composite with a yielding aluminum liner, and (b) Kevlar/epoxy with load-sharing liners (typically stainless steel, titanium alloy, or inconel). The aluminum-lined, graphite/epoxy tank is the most prevalent technology, but it has limitations. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the high pressure vessel from an aluminum-lined composite configuration so as to obtain a high strength, permeable light weight vessel. See particularly column 1 lines 25-40 of Seal et al.

With respect to claim 24, Examiner gives official notice that it would have been inherent that the fuel tank would have included an expulsion device so as to be able to pump the fuel from the tank to the combustor. Further, it is well known in the art that the expulsion device could be of the piston-type, bladder-type, diaphragm-type, free-surface-type etc.

7. Claims 1, 6, 7, 9, 11, 12, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Lampe et al. (U.S patent No. 5,097,659)** in view of **Seal et al. (U.S. 5,822,838).**

With respect to claims 1 and 9, **Lampe et al**. teach an apparatus for generating auxiliary and emergency power. This apparatus comprises a plurality of high-pressure storage vessels 22 (source of pressurized air); a source of jet fuel 52; a turbine 12; an airflow passageway joining the source of pressurized air 22 to the turbine 12; a fuel flow passage joining the source of jet fuel 52 to the turbine 12; and a separate valve assembly 24, 26, 56, 42, 60, 53, 410 located in each flow passageway for controlling the flow of compressed air and jet fuel into the turbine. Lampe et al. do not teach that the high-pressure storage vessels each have an aluminum-lined composite configuration. However, **Seal et al.** teach that high-performance fibers offer very high strength-to-weight ratios and are ideal for making lightweight pressure vessels. However, composite laminates fabricated with these fibers have relatively high permeability and cannot contain high-pressure liquids or gasses or low-pressure gasses for extended periods of time. Therefore, composite pressure vessels must have a liner to prevent leakage. For high pressure or gas containment, metal liners such as aluminum are typically used. For lightweight, high-pressure gas containment, there are basically two primary technologies (a) graphite/epoxy composite with a yielding aluminum liner, and (b) Kevlar/epoxy with load-sharing liners (typically stainless steel, titanium alloy, or inconel). The aluminum-lined, graphite/epoxy tank is the most prevalent technology, but it has limitations. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the high pressure vessel from an aluminum-lined composite configuration so as to obtain a high strength,

permeable light weight vessel. See particularly **Figure 4**; column 1 lines 7-8; column 6 lines 10-12 of Lampe; and column 1 lines 25-40 of Seal et al.

With respect to claim 6, **Lampe et al.** teach that the valve assembly located in the fuel flow passageway comprises a modulating fuel control valve 56. See particularly **Figure 4** of Lampe.

With respect to claim 7, **Lampe et al.** teach that the valve assembly located in the fuel flow passageway comprises a fixed orifice valve 410. See particularly **Figure 4** of Lampe.

With respect to claims 11 and 12, Examiner gives official notice that it would have been inherent that the fuel tank would have included an expulsion device so as to be able to pump the fuel from the tank to the combustor. Further, it is well known in the art that the expulsion device could be of the piston-type, bladder-type, diaphragm-type, free-surface-type etc.

With respect to claim 15, **Lampe et al.** teach that the valve assembly located in the fuel flow passageway comprises a modulating fuel control valve 56. See particularly **Figure 4** of Lampe.

With respect to claim 16, **Lampe et al.** teach that the valve assembly located in the fuel flow passageway comprises a fixed orifice valve 410. See particularly **Figure 4** of Lampe.

8. Claims 1, 4, 5, 7, 9, 13, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Lampe et al. (U.S patent No. 5,031,398)** in view of **Seal et al. (U.S. 5,822,838).**

With respect to claims 1 and 9, **Lampe et al**. teach an apparatus for generating auxiliary and emergency power. This apparatus comprises a plurality of high-pressure storage vessels 22 (source of pressurized air); a source of jet fuel 52; a turbine 12; an airflow passageway joining the source of pressurized air 22 to the turbine 12; a fuel flow passage joining the source of jet fuel 52 to the turbine 12; and a separate valve assembly 24, 26, 56, 42, 60, 53, 410 located in each flow passageway for controlling the flow of compressed air and jet fuel into the turbine. Lampe et al. do not teach that the high-pressure storage vessels each have an aluminum-lined composite configuration. However, **Seal et al.** teach that high-performance fibers offer very high strength-to-weight ratios and are ideal for making lightweight pressure vessels. However, composite laminates fabricated with these fibers have relatively high permeability and cannot contain high-pressure liquids or gasses or low-pressure gasses for extended periods of time. Therefore, composite pressure vessels must have a liner to prevent leakage. For high pressure or gas containment, metal liners such as aluminum are typically used. For lightweight, high-pressure gas containment, there are basically two primary technologies (a) graphite/epoxy composite with a yielding aluminum liner, and (b) Kevlar/epoxy with load-sharing liners (typically stainless steel, titanium alloy, or inconel). The aluminum-lined, graphite/epoxy tank is the most prevalent technology, but it has limitations. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the high pressure vessel from an aluminum-lined composite configuration so as to obtain a high strength,

permeable light weight vessel. See particularly **Figure 1**; column 1 lines 7-8; column 6 lines 10-12 of Lampe; and column 1 lines 25-40 of Seal et al.

With respect to claim 4, **Lampe et al.** teach that the valve assembly located in the air flow passageway comprises a modulating air control valve 22 and a separate regulator and shutoff valve 20 located between the air control valve 22 and the source of pressurized air 14. See particularly **Figure 1** of Lampe.

With respect to claim 5, **Lampe et al.** teach that the valve assembly located in the air flow passageway comprises a fixed orifice valve 30 and a separate regulator and shutoff valve 20 located between the fixed orifice valve 30 and the source of pressurized air 14. See particularly **Figure 1** of Lampe.

With respect to claim 7, **Lampe et al.** teach that the valve assembly located in the fuel flow passageway comprises a fixed orifice valve 38. See particularly **Figure 1** of Lampe.

With respect to claim 13, **Lampe et al.** teach that the valve assembly located in the air flow passageway comprises a modulating air control valve 22 and a separate regulator and shutoff valve 20 located between the air control valve 22 and the source of pressurized air 14. See particularly **Figure 1** of Lampe.

With respect to claim 14 **Lampe et al.** teach that the valve assembly located in the air flow passageway comprises a fixed orifice valve 30 and a separate regulator and shutoff valve 20 located between the fixed orifice valve 30 and the source of pressurized air 14. See particularly **Figure 1** of Lampe.

With respect to claim 16, **Lampe et al.** teach that the valve assembly located in the fuel flow passageway comprises a fixed orifice valve 38. See particularly **Figure 1** of Lampe.

Response to Arguments

9. Applicant's arguments with respect to claims 1, 4-9 and 11-28 have been considered but are moot in view of the new ground(s) of rejection.

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Rodriguez whose telephone number is 703-605-1140. The examiner can normally be reached on Monday-Friday 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine R Yu can be reached on 703-308-2675. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0861.

W.R

W.R
September 17, 2003

JUSTINE R. YU
PRIMARY EXAM